

What is claimed is:

1. A method for composing a complex construct for use on a graphical display of a computerized device, the method comprising the steps of:

- 5 receiving a selection of basic constructor objects for use in the complex object, the selection of basic constructor objects chosen from a set of basic constructor object types including a button object type, a dial object type, an edit object type, and a container object type, each of the basic constructor object types defining respective basic constructor characteristics;
- 10 receiving a selection of at least one personality to assign to at least one of the basic constructor objects chosen from the selection of basic constructor object types, the selection of at least one personality chosen from a set of personality types that define extensions to basic constructor characteristics associated with basic constructor object types;
- 15 combining the selection of basic constructor objects with the selection of at least one personality to form a first complex construct; and
- operating the first complex construct on the graphical display according to a first operation state defined by the basic constructor characteristics associated with the basic constructor objects in the first complex construct and by the personalities assigned to the
- 20 basic constructor objects in the complex construct which define extensions to the basic constructor characteristics.

2. The method of claim 1 further comprising the steps of:

- receiving a modification to the selection of a personality assigned to at least one
- 25 of the basic constructor objects in the first complex construct; and
- in response to receiving the modification, transforming the first complex construct having the first operational state to a second complex construct having a second operational state.

30 3. The method of claim 2 further comprising the steps of:

operating the first complex construct to receive input indicating that the first complex object is to transform itself into a second complex construct by substituting a view, defined by the at least one personality assigned to at least one of the basic constructor objects in the first complex construct, with a new view defined by the modification received to the selection of one of the at least one personality.

4. The method of claim 1 wherein the step of receiving a selection of at least one personality includes the steps of:

receiving a selection of specific event handling functionality that is to be enabled for that personality in relation to a basic constructor object to which that personality is assigned; and

receiving a selection of specific view which that personality provides to that basic constructor object when rendered on the graphical display of the computerized device.

5. The method of claim 1 wherein each basic constructor object is an instantiation of a basic constructor class that defines the basic constructor characteristics which provide specific functionality including an event handling framework dedicated to supplying methods and event handling processing associated with that basic constructor class.

6. The method of claim 5 wherein:

the button object, when included in the complex construct, provides specific functionality to the complex construct to provide notification of a change to a selection state maintained by the button object upon receiving input;

the dial object, when included in the complex construct, provides specific functionality to the complex construct to provide a selection of a value from a range of possible values;

the edit object, when included in the complex construct, provides specific functionality to the complex construct to receive data for editing, to store the data and to provide access to the data; and

the container object, when included in the complex construct, provides at least one of a parenting functionality, a layout management functionality and an event interception functionality to the complex construct comprised of a combination of the basic constructor objects.

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7. The method of claim 5 wherein each basic constructor object has an associated set of applicable personalities, each applicable personality defining an extended set of event listeners that are specific to the basic constructor objects to which those personalities are applicable, and which extend the event management functionality provided by the basic constructor characteristics of the basic constructor type from which that basic constructor object is instantiated.

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8. The method of claim 7 wherein each applicable personality for a basic constructor object further defines a stock view for the basic constructor object when rendered on the graphical display of the computerized device.

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9. The method of claim 1 wherein the complex construct is a scroll bar including two basic button constructor objects combine with respective scroll bar button personalities, a basic dial constructor object combine with a respective scroll bar dial personality, and a basic container constructor object combine with a respective scroll bar container personality.

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10. A method for composing a complex construct for use on a graphical display of a computerized device, the method comprising the steps of:

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providing four basic constructor objects which may be selected for use in the complex construct, the four basic constructor objects including a button object, a dial object, an edit object and a container object;

receiving a selection of basic constructor objects from the four basic constructor objects for use in the complex construct;

providing a selection of personalities which may be assigned to the selection basic constructor objects;

receiving a selection of at least one selected personality from the selection of personalities to assign the selection of basic constructor objects to compose the complex

5 construct; and

displaying the complex construct on the graphical display according to characteristics defined by the basic constructor objects in the complex construct and by personalities assigned to the basic constructor object in the complex construct.

10 11. A computerized device comprising:

an input output interface;

a display;

a memory system;

a processor;

15 an interconnection mechanism coupling the input output interface, the display, the memory system and the processor;

wherein the memory system is encoded with a constructor application that when performed on the processor, produces a constructor process that causes the computer system to compose a complex construct for use on the display of the computerized device

20 by performing the operations of:

receiving, via the input output interface, a selection of basic constructor objects for use in the complex object, the selection of basic constructor objects chosen from a set of basic constructor object types including a button object type, a dial object type, an edit object type, and a container object type, each of the basic constructor object types

25 defining respective basic constructor characteristics;

receiving, via the input output interface, a selection of at least one personality to assign to at least one of the basic constructor objects chosen from the selection of basic constructor object types, the selection of at least one personality chosen from a set of personality types that define extensions to basic constructor characteristics associated

30 with basic constructor object types;

combining, in the memory system, the selection of basic constructor objects with the selection of at least one personality to form a first complex construct; and

operating the first complex construct on the display according to a first operation state defined by the basic constructor characteristics associated with the basic constructor objects in the first complex construct and by the personalities assigned to the basic constructor objects in the complex construct which define extensions to the basic constructor characteristics.

12. The computerized device of claim 11 wherein the constructor process further performs the operations of:

receiving, via the input output interface, a modification to the selection of a personality assigned to at least one of the basic constructor objects in the first complex construct; and

in response to receiving the modification, transforming the first complex construct having the first operational state to a second complex construct having a second operational state.

13. The computerized device of claim 12 wherein the constructor process further performs the operations of:

operating the first complex construct to receive input indicating that the first complex object is to transform itself into a second complex construct by substituting a view, defined by the at least one personality assigned to at least one of the basic constructor objects in the first complex construct, with a new view defined by the modification received to the selection of one of the at least one personality.

14. The computerized device of claim 11 wherein when the constructor process performs the operation of receiving a selection of at least one personality, the constructor process performs the operations of:

receiving a selection of specific event handling functionality that is to be enabled for that personality in relation to a basic constructor object to which that personality is assigned; and

receiving a selection of specific view which that personality provides to that basic constructor object when rendered on the graphical display of the computerized device.

15. The computerized device of claim 11 wherein each basic constructor object is an instantiation in the memory system of a basic constructor class that defines the basic constructor characteristics which provide specific functionality including an event handling framework dedicated to supplying methods and event handling processing associated with that basic constructor class.

16. The computerized device of claim 15 wherein:

the button object, when included in the complex construct, provides specific functionality to the complex construct to provide notification of a change to a selection state maintained by the button object upon receiving input;

the dial object, when included in the complex construct, provides specific functionality to the complex construct to provide a selection of a value from a range of possible values;

the edit object, when included in the complex construct, provides specific functionality to the complex construct to receive data for editing, to store the data and to provide access to the data; and

the container object, when included in the complex construct, provides at least one of a parenting functionality, a layout management functionality and an event interception functionality to the complex construct comprised of a combination of the basic constructor objects.

17. The computerized device of claim 15 wherein each basic constructor object has an associated set of applicable personalities, each applicable personality defining an extended set of event listeners that are specific to the basic constructor objects to which

those personalities are applicable, and which extend the event management functionality provided by the basic constructor characteristics of the basic constructor class from which that basic constructor object is instantiated.

5 18. The computerized device of claim 17 wherein each applicable personality for a basic constructor object further defines a stock view for the basic object constructor when rendered on the graphical display of the computerized device.

10 19. The method of claim 11 wherein the complex construct is a scroll bar displayed on the display and includes two basic button constructor objects combine with respective scroll bar button personalities, a basic dial constructor object combine with a respective scroll bar dial personality, and a basic container constructor object combine with a respective scroll bar container personality.

15 20. A computerized device comprising:
an input output interface;
a display;
a memory system;
a processor;
20 an interconnection mechanism coupling the input output interface, the display, the memory system and the processor;

wherein the memory system is encoded with a constructor application that when performed on the processor, produces a constructor process that causes the computer system to compose a complex construct for use on the display of the computerized device
25 by performing the operations of:

providing four basic constructor objects which may be selected for use in the complex construct, the four basic constructor objects including a button object, a dial object, an edit object and a container object;

receiving a selection of basic constructor objects from the four basic constructor
30 objects for use in the complex construct;

providing a selection of personalities which may be assigned to the selection basic constructor objects;

receiving a selection of at least one selected personality from the selection of personalities to assign the selection of basic constructor objects to compose the complex construct; and

displaying the complex construct on the graphical display according to characteristics defined by the basic constructor objects in the complex construct and by personalities assigned to the basic constructor object in the complex construct.

21. A computer program product having a computer-readable medium including computer program logic encoded thereon that, when executed on a computer system having a coupling of a memory system, a processor, and a display provides a method for composing complex construct for use on the display of the computerized system by performing the operations of:

receiving, via the input output interface, a selection of basic constructor objects for use in the complex object, the selection of basic constructor objects chosen from a set of basic constructor object types including a button object type, a dial object type, an edit object type, and a container object type, each of the basic constructor object types defining respective basic constructor characteristics;

receiving, via the input output interface, a selection of at least one personality to assign to at least one of the basic constructor objects chosen from the selection of basic constructor object types, the selection of at least one personality chosen from a set of personality types that define extensions to basic constructor characteristics associated with basic constructor object types;

combining, in the memory system, the selection of basic constructor objects with the selection of at least one personality to form a first complex construct; and

operating the first complex construct on the display according to a first operation state defined by the basic constructor characteristics associated with the basic constructor objects in the first complex construct and by the personalities assigned to the basic

constructor objects in the complex construct which define extensions to the basic constructor characteristics.

22. A computerized device comprising:

- 5 an input output interface;
 a display;
 a memory system;
 a processor;
 an interconnection mechanism coupling the input output interface, the display, the
10 memory system and the processor;

 wherein the memory system is encoded with a constructor application that when performed on the processor, produces a constructor process that provide a means for composing a complex construct for use on the display of the computerized device and which includes:

- 15 means for receiving, via the input output interface, a selection of basic constructor objects for use in the complex object, the selection of basic constructor objects chosen from a set of basic constructor object types including a button object type, a dial object type, an edit object type, and a container object type, each of the basic constructor object types defining respective basic constructor characteristics;

- 20 means for receiving, via the input output interface, a selection of at least one personality to assign to at least one of the basic constructor objects chosen from the selection of basic constructor object types, the selection of at least one personality chosen from a set of personality types that define extensions to basic constructor characteristics associated with basic constructor object types;

- 25 means for combining, in the memory system, the selection of basic constructor objects with the selection of at least one personality to form a first complex construct;
 and

- means for operating the first complex construct on the display according to a first operation state defined by the basic constructor characteristics associated with the basic
30 constructor objects in the first complex construct and by the personalities assigned to the

basic constructor objects in the complex construct which define extensions to the basic constructor characteristics.

23. A method for transforming complex constructs for use in a graphical interface environment, the method comprising the steps of:

defining a first complex construct to include at least one of:

- a basic dial constructor object;
- a basic edit constructor object;
- a basic button constructor object; and
- a basic container constructor object;

in combination with at least one personality;

receiving a modification to the at least one personality; and

transforming the first complex construct to a second complex construct according to the modification to the at least one personality.

24. The method of claim 23 wherein the step of receiving a modification to the at least one personality receive the modification in real time from an application that includes the first complex construct such that the first complex construct is transformed by the step of transforming in real-time to produce the second complex construct.